

CASTANEA

The Journal of the Southern Appalachian Botanical Club

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All persons interested in the botany of the Southern Appalachian Mountains are invited to join the club. Dues, including subscription to the Journal, are \$3.00 per year. Single copies of *Castanea*, seventy-five cents.

Notes and short scientific papers relating to the botany of the region are welcomed and will be published to the extent that the size of the Journal allows.

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CASTANEA

The Journal of the Southern Appalachian Botanical Club

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No. 3

Distribution of Some Rarely Collected Vascular Aquatic Plants in North Carolina*

ALBERT E. RADFORD

It is a well known fact that distribution maps and range data in manuals and monographs do not give an adequate picture of the abundance or rarity of a plant in a region. This is particularly true of the vascular aquatics of North Carolina. In this state a lack of data has been due in most cases to limited collections which in turn may be traced to a lack of familiarity with the species and to the inaccessibility of many of them. A few are actually rare. The present paper gives distribution data on some of the previously rarely collected aquatics from North Carolina. Most of the data given herein are based on my collections of 1949 and 1950. A search of the Gray Herbarium, Herbarium of the New York Botanical Garden, the United States National Herbarium, the Herbarium of the Academy of Natural Sciences of Philadelphia, Duke University Herbarium, North Carolina State College Herbarium, and the Herbarium of the University of North Carolina revealed very few collections of aquatics from this state.

The species discussed are deposited in the Herbarium of the University of North Carolina unless otherwise indicated. The genera are arranged according to the 8th Edition of "Gray's Manual of Botany", 1950. The general range data are based on that given by M. L. Fernald in "Gray's Manual of Botany", 8th Edition, 1950, and in W. C. Muenscher's "Aquatic Plants of the United States", 1944.

ECHINODORUS CORDIFOLIUS (L.) Griseb. BERTIE COUNTY: muddy bank of Salmon Creek near U.S. 17, July 23, 1949, Radford 4694;

*This work was supported in part by a grant from the Carnegie Foundation for the Advancement of Teaching.

CHOWAN COUNTY: shallow water, edge of stream $1\frac{1}{2}$ miles east of Edenton, July 3, 1922, *L. F. Randolph* 658 (Gray Herb.); marsh near Edenton, July 20, 1938, *R. K. Godfrey* 5353 (Gray Herb.); NEW HANOVER COUNTY: Wilmington, August 2, 1900, *C. S. Williamson* (U. S. Nat. Herb. & Herb. Acad. Nat. Sci. Phila.).

Found mostly in the Mississippi Valley, and from northwestern Florida to southeastern Virginia. At the Bertie County location (1949) only three plants were found. It has the habit of *Sagittaria*, so could be easily overlooked.

SAGITTARIA MONTEVIDENSIS Cham. & Schlecht. NEW HANOVER COUNTY: Wilmington, October 1888, *Gerald McCarthy*.

Naturalized from Brazil, local in the Southeastern States. This species was found in 1888 by Gerald McCarthy, in all probability near the port area of Wilmington. Apparently it did not become well-established or wide-spread, and has not been collected since (*J. G. Smith*: "North American Species of *Sagittaria* and *Lophotocarpus*." 6th Annual Report of Mo. Bot. Garden. 1894.).

ANACHARIS CANADENSIS (Michx.) Planchon. BRUNSWICK COUNTY: Orton Lake, *B. W. Wells*, July 23, 1940 (N.C. State Coll. Herb.); McDOWELL COUNTY: abundant in pools and small streams at State Fish Hatchery north of Marion, July 8, 1950, *Radford* 5279; WATAUGA COUNTY: Snyder's Lake at Blowing Rock, August 22, 1949, *Radford* 4950.

Has a wide distribution throughout the United States. It has a rather limited distribution in North Carolina, according to my observations.

ANACHARIS DENSA (Planchon) Marie-Victorin. BRUNSWICK COUNTY: small pools on Orton Plantation road near entrance to plantation, May 21, 1949, *Radford* 4284; Sturgeon Creek, east of Leland, near U.S. 74-76, May 13, 1950, *R. K. Godfrey* & *H. Wiebe* 50363 (N.C. State Coll. Herb.); Sturgeon Creek near U.S. 74-76, June 2, 1949, *Radford* 4352; DARE COUNTY: Currituck Sound, near Duck, July 5, 1950, *Radford* 4536; McDOWELL COUNTY: abundant in pools and small streams at State Fish Hatchery north of Marion, June 8, 1950, *Radford* 5279; NEW HANOVER COUNTY: pool one mile north of U.S. 17, on Wrightsboro road, June 3, 1949, *Radford* 4355; shaded sluggish stream 0.6 mile south of Castle Hayne, near U.S. 117, June 1, 1950, *Radford* 5156; ORANGE COUNTY: pool in Spencer Dormitory garden, Chapel Hill, September 28, 1939, *George Christenberry*; VANCE COUNTY: silt filled pond north of U.S. 158, near Ruin Creek, 2.8 miles east of Vance County line, June 25, 1949, *Radford* 4522; WAKE

COUNTY: Lake Myra, May 18, 1948, *L. A. Whitford 135* (N.C. State Coll. Herb.); shallow pool near U.S. 64, 3 miles west of Zebulon, June 13, 1949, *Radford 4493*; WILSON COUNTY: lake near U.S. 264, 7 miles southeast of Wilson, June 13, 1949, *Radford 4484*.

Naturalized from South America. Muenscher does not have it recorded from North Carolina, but Fernald, 1950, gives its range from Florida and the Gulf States north to New England, New York, Kentucky, and Nebraska. Apparently it is spreading rather rapidly on the coastal plain of this state. Two years ago only a few sprigs of this species were noticed in University Lake at Chapel Hill; today it covers several acres. Fishermen using the plant as an oxygenator for their minnows seem to be responsible for some of its rapid distribution.

ANACHARIS NUTTALLII (Planchon) St. John. CRAVEN COUNTY: near U.S. 70, 1 mile south of Trent River at New Bern, May 20, 1949, *L. A. Whitford 117* (N.C. State Coll. Herb.); Brice's Creek, 2 miles east of New Bern, near U.S. 70, May 22, 1949, *L. A. Whitford 130* (N.C. State Coll. Herb.); in shallows of Scott's Creek, 2 miles south of New Bern, near U.S. 70, June 11, 1950, *L. A. Whitford 185* (N.C. State Coll. Herb.); McDOWELL COUNTY: State Fish Hatchery pool north of Marion, August 18, 1949, *Radford 4886*; NEW HANOVER COUNTY: Greenfield Lake at Wilmington, July 29, 1938, *B. W. Wells & R. K. Godfrey 14818* (Gray Herb.); PERQUIMANS COUNTY: Perquimans River at Hertford, July 23, 1949, *Radford 4686*; TYRRELL COUNTY: Alligator River at Ft. Landing, July 23, 1949, *Radford 4956*.

Fernald reports this species as far south as North Carolina. It is very abundant in Currituck and Albemarle Sounds.

LIMNOBIUM SPONGIA (Bosc.) Steud. BRUNSWICK COUNTY: stagnant pool in Bell Swamp, 2 miles southwest of Winnabow, June 3, 1950, *Radford 5215*; DARE COUNTY: stagnant pool near U.S. 158, near Currituck Sound, July 23, 1949, *Radford 4654*; pool in swamp near Kitty Hawk, July 5, 1950, *Radford 5427*; NEW HANOVER COUNTY: Wilmington, July 1895, *C. S. Williamson* (Herb. Acad. Nat. Sci. Phila.); Wilmington, west of river, October 6, 1908, *E. B. Bartram* (Herb. Acad. Nat. Sci. Phila.); PERQUIMANS COUNTY: pool in cypress swamp 1.5 miles southeast of Newhope, July 7, 1950, *Radford 5467*; TYRRELL COUNTY: ditch near U.S. 64, 4½ miles west of Ft. Landing, July 22, 1949, *Radford 4625*; open pool on cypress swamp near Ft. Landing, July 4, 1950, *Radford 5406*; *M. A. Curtis*, (Gray Herb.).

This species ranges from Florida to Delaware and into the Mississippi Valley. It is not very abundant in North Carolina. It

has been found occasionally in pools in cypress swamps. I have seen it in flower only in open pools on the edges of swamps.

ELEOCHARIS EQUISETOIDES (Ell.) Torr. BRUNSWICK COUNTY: pool 10 miles north of Southport, June 3, 1950, *Radford* 5206; NEW HANOVER COUNTY: pool $1\frac{1}{2}$ miles east of U.S. 421, on Castle Hayne road, June 2, 1949, *Radford* 4363.

H. K. Svenson (*Rhodora* 31:132. 1929.) reported a specimen from near Fayetteville, collected by von Schweinitz. He also reported its range as from Massachusetts to Florida and Texas, and locally inland to Michigan and Wisconsin. It is rather rare in North Carolina. In each of the above locations it seemed to consist of only one clone.

WOLFFIELLA FLORIDANA (J. D. Sm.) C. H. Thompson. BEAUFORT COUNTY: Pamlico River swamp, near Chocowinity, May 24, 1947, *L. A. Whitford* (N.C. State Coll. Herb.); CAMDEN COUNTY: sluggish water in ditch beside U.S. 158, 8 miles east of Elizabeth City, July 22, 1949, *Radford* 4664; DARE COUNTY: fresh pond in wooded dunes, Kill-Devil Hill, June 29, 1947, *W. B. Fox* & *L. A. Whitford* (N.C. State Coll. Herb.); stagnant pool beside U.S. 158, near Currituck Sound, July 23, 1949, *Radford* 4652; LENOIR COUNTY: O'Kelly pond, 2 miles east of Kinston, just off U.S. 70, May 20, 1949, *L. A. Whitford* 126 (N.C. State Coll. Herb.); Kelly's pond, just off U.S. 70, 2 miles east of Kinston, July 11, 1950, *L. A. Whitford* 188 (N.C. State Coll. Herb.); NEW HANOVER COUNTY: Wilmington, April 14, 1911, *E. B. Bartram* & *Bayard Long* (Herb. Acad. Nat. Sci. Phila.); Greenfield Lake, Wilmington, June 29, 1938, *R. K. Godfrey* & *B. W. Wells* (N.C. State Coll. Herb.); pool 3 miles east of Middle Sound, June 1, 1950, *Radford* 5162; PASQUOTANK COUNTY: tidal marsh on Pasquotank River, near U.S. 17-158, July 23, 1949, *Radford* 4671, PERQUIMANS COUNTY: pool in cypress swamp south of Newhope, July 7, 1950, *Radford* 5453; pool in cypress swamp 1.5 miles southeast of Newhope, July 7, 1950, *Radford* 5461; ROBESON COUNTY: pool beside U.S. 74, 2 miles sotheast of Lumberton, May 21, 1949, *Radford* 4332; TYRRELL COUNTY: ditch near U. S. 64, $2\frac{1}{2}$ miles west of Ft. Landing, July 22, 1949, *Radford* 4627; brackish marsh beside U.S. 64, west of Columbia city limits, July 22, 1949, *Radford* 4607; WAYNE COUNTY: Davis Mill Pond, near N.C. 55, east of Seven Springs, August 11, 1949, *Radford* 4736.

Found chiefly in the Southeastern States. Fairly common on the coastal plain in stagnant pools.

WOLFFIA COLUMBIANA Karst. DARE COUNTY: fresh water lake, Nag's Head, *W. C. Coker* & *H. H. Braxton*; fresh water among dunes, 1 mile south of Kill Devil Hills, May 22, 1937; *L. A. Whitford* (N.C.

State Coll. Herb.); stagnant pool near U.S. 158, near Currituck Sound, July 23, 1949, *Radford 4649*; PERQUIMANS COUNTY: pool in cypress swamp south of Newhope, July 7, 1950, *Radford 5452*.

Ranges throughout the eastern and central United States. The only previous records that I have found are those of Coker & Braxton, and Whitford from Dare County. It is definitely rare in North Carolina, but abundant where found.

HETERANTHERA RENIFORMIS R. & S. CHOWAN COUNTY: open pigpen near N.C. 32, south of Edenton, July 7, 1950, *Radford 5472*; MARTIN COUNTY: shallow pool in cypress-gum swamp near Welch Creek, near U.S. 64, at Washington County line, July 21, 1949, *Radford & Rodgers 4586*; PERQUIMANS COUNTY: bog in cypress swamp, south of Newhope, July 7, 1950, *Radford 5456*; Western North Carolina, *P. O. Schallert 5145, 1825* (Duke Univ. Herb.).

Ranges from Florida to Texas and Mexico, north to Connecticut, New York, Kentucky, southern Illinois, Missouri, and Nebraska. Rather rare in North Carolina and where it does occur, very few plants are found.

CERATOPHYLLUM DEMERSUM L. BEAUFORT COUNTY: bay off Pamlico River, near Washington Park, July 3, 1950, *Radford 5377*; BRUNSWICK COUNTY: marsh between Alligator Creek and Cape Fear River, near U. S. 74-76, May 20, 1949, *Radford 4249*; fresh water marsh near U.S. 74-76, near Alligator Creek, June 2, 1950, *Radford 5172*; CRAVEN COUNTY: in 2-4 ft. water, Jack Smith Creek, Oaks Road, New Bern, June 13, 1947, *L. A. Whitford* (N.C. State Coll. Herb.); Jack Smith Creek, edge of New Bern, May 20, 1949, *L. A. Whitford 131* (N.C. State Coll. Herb.); DARE COUNTY: fresh water lake, July 14, 1941, *Dorothy Fuller* (U.S. Nat. Herb.); FORSYTH COUNTY: pond near Winston-Salem, *P. O. Schallert 1408* (Duke Univ. Herb.); PASQUOTANK COUNTY: tidal marsh on Pasquotank River, near U.S. 17-158, July 23, 1949, *Radford 4668*; PERQUIMANS COUNTY: Perquimans River at Hertford, July 23, 1949, *Radford 4679*; TYRRELL COUNTY: shallow brackish water in Alligator River at Ft. Landing, July 22, 1949, *Radford 4613*; VANCE COUNTY: silt-filled pond, north of U.S. 158, on Ruin Creek, 2.8 miles east of Vance-Granville County line, June 25, 1949, *Radford 4521*.

Found throughout the United States. It has a rather sporadic distribution on the coastal plain of North Carolina and has been found once in the Piedmont.

CERATOPHYLLUM ECHINATUM Gray. BRUNSWICK COUNTY: swamp, edge of Orton Plantation pond, June 3, 1950, *Radford 5209*; DARE

COUNTY: in woods pool just west of Collington, June 11, 1949, *Godfrey & Fox* (N.C. State Coll. Herb.); pool in swamp near Kitty Hawk, July 5, 1950, *Radford* 5430; PERQUIMANS COUNTY: pool in swamp south of Newhope, July 7, 1950, *Radford* 5457.

Found chiefly in the eastern United States. Very local on the coastal plain of this state.

NELUMBO LUTEA (Willd.). Pers. COLUMBUS COUNTY: Lake Waccamaw, June 28, 1928, *P. O. Schallert* 10662 (Duke Univ. Herb.); Lake Waccamaw, August 29, 1938, *R. K. Godfrey* 6307 (Gray Herb.); Lake Waccamaw, May 22, 1939, *Bettie Jones* 971 (Herb. Acad. Nat. Sci. Phila.); CRAVEN COUNTY: shallows of Jack Smith Creek, west of New Bern, Aug. 3, 1933 (N.C. State Coll. Herb.).

Local throughout eastern United States. The only collections I have come across are from the two stations cited above; I have reports of it from three other stations but so far I have not seen the specimens.

CABOMBA CAROLINIANA A. Gray. BRUNSWICK COUNTY: Orton Lake, July 23, 1940, *B. W. Wells* (N.C. State Coll. Herb.); small pool on Orton Plantation road, near entrance to plantation, May 21, 1949, *Radford* 4286; Sturgeon Creek, near U.S. 74-76, June 2, 1949, *Radford* 4351; CRAVEN COUNTY: Jack Smith Creek, west of New Bern, Aug. 3, 1933 (N.C. State Coll. Herb.); Jack Smith Creek, New Bern, June 13, 1940, *L. A. Whitford* (N.C. State Coll. Herb.); CURRITUCK COUNTY: in woods pool 1 mile west of Kill Devil Hills, June 10, 1949, *L. A. Whitford* (N.C. State Coll. Herb.); FORSYTH COUNTY: July 12, 1940, *P. O. Schallert* (Gray Herb.); Weaver's Lake, near U.S. 421, west of Kernersville, August 22, 1949, *Radford* 4966; NEW HANOVER COUNTY: in shallow water, Greenfield Lake, Wilmington, May 13, 1950, *Godfrey & Wiebe* 50349 (N.C. State Coll. Herb.); shaded sluggish stream near U.S. 117, 0.6 mile south of Castle Hayne, June 1, 1950, *Radford* 5157; south of Wilmington, June 26, 1890, *F. V. Coville* 122 (U.S. Nat. Herb. & Gray Herb.); *M. A. Curtis* (Herb. Acad. Nat. Sci. Phila.).

Ranges throughout the Southeastern States. Occurs locally on the coastal plain of North Carolina. In Weaver's Lake it was introduced very probably with carp that were hauled from Lake Mattamuskeet and vicinity near the coast.

MYRIOPHYLLUM PINNATUM (Walt.) BSP. CURRITUCK COUNTY: shallow pools on brackish marsh of Back Bay, east of Morse Point, August 1, 1934, *M. L. Fernald & Bayard Long* 4080 (Gray Herb.); NEW HANOVER COUNTY: pool 1½ miles east of U.S. 421, on Castle Hayne to Hampstead road, June 3, 1949, *Radford* 4372; SCOTLAND

COUNTY: shallow stream near Laurinburg, July 1, 1938, *R. K. Godfrey 5032* (Gray Herb.); TYRRELL COUNTY: sluggish drainage ditch on Sandy Point road, 3 miles west of Sandy Point, October 7, 1949, *Radford 5079*.

Ranges from Florida to Texas, north to southern New England, West Virginia, Kentucky, Illinois, and Iowa. I have found only two clones of this rare species in North Carolina.

HOTTONIA INFLATA Ell. DARE COUNTY: Cape Hatteras, *W. W. Ashe* (U.S. Nat. Herb.); pond, Kitty Hawk, May 8, 1937, *B. W. Wells & I. V. Shunk 1621* (N.C. State Coll. Herb.).

Found locally from Florida to Texas, north to New England, western New York, Ohio, Indiana, southern Illinois, and Missouri. It is a winter annual that flowers in early spring. This growth habit may account for its having been so rarely seen and collected.

UTRICULARIA VULGARIS L. var. *AMERICANA* Gray. CURRITUCK COUNTY: Kitty Hawk, May 28, 1933, *H. L. Blomquist 4906* (Duke Univ. Herb.).

Ranges nearly throughout the United States except in the south. This is one of the rarest aquatics in North Carolina.

DEPARTMENT OF BOTANY
UNIVERSITY OF NORTH CAROLINA
CHAPEL HILL, NORTH CAROLINA

The Mountain Oat Grass Communities of the Region of Mountain Lake, Virginia

WILLIAM R. JENKINS and MARION A. AYRES

The mountain oat grass (*Danthonia compressa*) is a high altitude grass of trails and clearings in the Southern Appalachians into which region it ranges from the New England states. When developed in pure stand, its ability to resist the invasion of woody plants has not been sufficiently emphasized. It is the purpose of this paper to describe a few long-existent communities of this grass which occur between the altitudes of 3,500 and 4,300 feet in the region of Mountain Lake, Giles County, Virginia, and to point out the implication of these facts in relation to reports of "original" grass clearings. The species are listed according to usual scale of dominance (5) dominant, (4) subdominant, (3) frequent, (2) infrequent, (1) rare.

1. *Moonshine Dell*: altitude, 3800 feet. Approximately one mile east of the Mountain Lake Biological Station of the University of Virginia is located a field (35x80 feet) of a former farm. This area has not been cultivated for at least seventy-five years. The eastern edge of the field, whose longitudinal axis lies in a N-S direction, is bordered by a *Rhododendron maximum* thicket on the slopes of Farley's Branch. Although most of the area is dominated by *Danthonia compressa*, *Festuca ovina* shares the dominance along the borders. In the field margin are found seedlings of *Quercus rubra* and *Quercus alba*, and *Castanea dentata* shoots. All show signs of repression, having reduced and yellowing leaves and little terminal growth. Immediately surrounding this area, however, many of these young plants are doing well, having normal leaves and good terminal growth.

Species	Abundance	Species	Abundance
<i>Danthonia compressa</i>	5	<i>Rubus allegheniensis</i>	2
<i>Festuca ovina</i>	4	<i>Deschampsia flexuosa</i>	2
<i>Rubus hispidus</i>	4	<i>Pinus rigida</i>	1
<i>Potentilla canadensis</i>	4	<i>Trifolium repens</i>	1
<i>Pedicularis canadensis</i>	3	<i>Solidago</i> sp.	1
<i>Hypericum densiflorum</i>	3	<i>Chrysanthemum leucanthemum</i>	1
<i>Pteridium aquilinum</i> var.			
<i>latiusculum</i>	2	<i>Vaccinium vacillans</i>	1
<i>Plantago lanceolata</i>	2	<i>Robinia pseudoacacia</i>	1

1. *Old Farm Area*: altitude, 3700 feet. Several areas are located along the road to the Mountain Lake Hotel, about one-half mile from the Biological Station. These areas are open fields, formerly

part of a farm. It is known that this land has not been under cultivation for the past fifty years. Three of the fields will be discussed in some detail.

a. Grass Fields. These two fields are situated on the west side of the road, 100 yards apart, 3600 square feet. Both are dominated by mountain oat grass, the next most abundant species being *Rubus hispidus*.

Species	Abundance	
	Grass Field 1	Grass Field 2
<i>Danthonia compressa</i>	5	5
<i>Rubus hispidus</i>	4	4
<i>Achillea millefolium</i>	3	3
<i>Potentilla canadensis</i>	3	2
<i>Rubus allegheniensis</i>	—	3
<i>Trifolium pratense</i>	2	3
<i>Plantago lanceolata</i>	—	3
<i>Festuca ovina</i>	2	2
<i>Chrysanthemum leucanthemum</i>	2	—
<i>Solidago</i> sp.	1	2
<i>Pteridium aquilinum</i> var. <i>latiusculum</i>	1	1
<i>Acer rubrum</i>	1	—

Two vegetative "islands" of mesic nature occur in the midst of the second grass field which is itself xeric in nature. One of these is a dense stand of *Solidago*, about five feet in diameter. Under the extreme shade condition produced by the goldenrod, *Festuca ovina* is found in abundance. The other "island" is of mixed species, including *Deschampsia flexuosa*, *Crataegus*, *Oxalis montana*, *Potentilla canadensis*, *Trifolium repens*, *Achillea millefolium*, *Fragaria virginiana*, and *Solidago* sp., with *Festuca ovina* forming a border. Two suppressed individuals of *Crataegus* are in the border and show positive signs of dying out, since no annual elongation of vertical stems has occurred this year. This is accompanied by yellowing leaves.

b. Fern Field. This field, 70 x 90 feet, is on the east side of the road opposite the first grass field. It is characterized by a complete coverage of the bracken fern, *Pteridium aquilinum* var. *latiusculum*. *Festuca ovina*, however, appears to be taking over, as it is more abundant in addition to the fact that there is a noticeable decrease in number of bracken individuals since last year. In the center of the field the number and size of bracken is diminished where there

is a decided decrease in humus layer. Here *Rubus hispidus* is the dominant, with goldenrod occurring in increasing numbers.

Species	Abundance	Species	Abundance
<i>Festuca ovina</i>	5	<i>Pedicularis canadensis</i>	2
<i>Pteridium aquilinum</i> var.		<i>Danthonia compressa</i>	1
<i>latiusculum</i>	4	<i>Lilium superbum</i>	1
<i>Rubus hispidus</i>	4	<i>Panicum latifolium</i>	1
<i>Fragaria virginiana</i>	4	<i>Trifolium pratense</i>	1
<i>Chrysanthemum leucanthemum</i>	3	<i>Boykinia aconitifolia</i>	1
<i>Solidago</i> sp.	3	<i>Vaccinium vacillans</i>	1
<i>Plantago lanceolata</i>	3		
<i>Achillea millefolium</i>	2		

3. *Old Sawmill Area*: altitude, 3700 feet. In 1934, a sawmill was removed from this area which is located approximately one mile northeast of the Biological Station along John's Creek Trail. The clearing measures thirty-six feet in its north-south direction and thirty-three feet in its east-west direction. Mountain oat grass dominates the clearing with *Rubus hispidus* as the subdominant. The *R. hispidus*, although listed as a subdominant, is highly repressed, averaging about three inches in height with each plant bearing from three to five leaves. There is a definite transition from grass to shrub to tree layers.

Species	Abundance	Species	Abundance
<i>Danthonia compressa</i>	5	<i>Coreopsis major</i>	2
<i>Rubus hispidus</i>	4	<i>Plantago lanceolata</i>	2
<i>Rubus allegheniensis</i>	3	<i>Habenaria ciliaris</i>	1
<i>Deschampsia flexuosa</i>	3	<i>Panicum latifolium</i>	1
<i>Pteridium aquilinum</i> var.		<i>Aster acuminatus</i>	1
<i>latiusculum</i>	2	<i>Prenanthes alba</i>	1
<i>Solidago</i> sp.	2		

4. *Bobb's Field*: altitude, 4200 feet. On the neighboring ridge top of Big Mountain is an isolated five-acre farm clearing, which has been abandoned for 50 years. Up to ten years ago this large area was a relatively pure stand of mountain oat grass. Ten years ago it was mowed for hay which may have accounted for the occurrence at the present on the down slope half, of extensive patches of goldenrod (*Solidago altissima*). The half on the nearly level ridge-top was clearly dominated by the oat grass. The significant fact is that not a woody plant of any kind could be found on the area which is sharply dominated on every side by the northern red oak forest. What

successional relation the oat grass might have could not be determined. The goldenrod patches appeared to be still enlarging. How much the successional relation of these species depends on the seasonal precipitation is a speculation to be checked. Considering Bobb's Field in the total picture of similar areas in the region it would seem probable that all of it would return to a dominance of oat grass. (Note: The data on Bobb's Field was contributed by B. W. Wells.)

5. *Trails and Abandoned Roads*: altitude, 3000 feet and above. Correlated with the degree of disturbance of the original forest vegetation, the trails and old roads show varying density of the oat grass. Its evident persistence in little used trails and long-abandoned logging roads is to be noted everywhere.

DISCUSSION AND CONCLUSIONS

Danthonia compressa occurs on open areas only, at altitudes above 2000 feet at this latitude. Below this altitude, where climatic conditions are unfavorable to *D. compressa*, woody plants succeed the herbaceous vegetation. Normally, the higher the altitude, the more pronounced the resistance to woody invasion. Farther north it is present at lower altitudes where a similar climate exists. The grass is found to be the dominant only in areas which have undergone a profound and continued disturbance created by man. This disturbance has been of such magnitude as to bring about the elimination of woody regeneration. Support is thus given to Wells' theory of Indian origin of certain grass areas in the mountains which existed prior to the advent of the white man, in that these are all grass balds initiated by man. Raup has described similar balds on the higher, rounded mountain tops and summits of the Black Rock Forest in New York. Fire has been suggested as the cause of these grass areas, but the occurrence of this dominant in trails and the absence of succession by fire cherry excludes this possibility.

Our field observations indicate a succession of the grasses in cleared areas. It appears that *Festuca ovina* invades such a clearing and eventually crowds out other herbaceous vegetation and small shrubs. There is some evidence that *Deschampsia flexuosa* plays a similar role. These grasses seem to be succeeded by *Danthonia compressa*. This is borne out by the occurrence of *Festuca ovina* bordering shrubs and other herbaceous areas. It is possible that this is due to the more xeric character of *D. compressa*. The dominance of mountain oat grass is believed to continue because of the complete filling of the surface soil by its multitude of tiny, fibrous roots.

It is believed from our observations that edaphic factors do not play an important part over this area because of the variance of soil type and because areas contingent to the grassy ones, apparently having the same soil type, are never dominated by any of the grasses mentioned. These latter areas are always in forest or shrub cover.

SUMMARY

Four old intensively disturbed and abandoned areas in the Virginia mountains, now in grass, are described. The length of time since abandonment ranges from 16 to 75 years. That these high altitude areas (3700-4000 feet) have not long since reverted to forest makes them stand in strong contrast to the abandoned fields of lower altitudes which rapidly develop a woodland and forest cover.

Dominance is presented on a 5 to 1 scale with *Danthonia compressa* as the most important species. A partial list of vegetation is included.

Such grass communities may only appear after prolonged and severe human disturbance of the original forested site. A brief weed stage is typically followed by *Festuca ovina* and this in turn by the presumed climax or permanent stand of *Danthonia compressa*. Continued dominance is suggested as being a result of intensive root competition without the aid of fire.

Edaphic factors are not believed to play an important part in determination of dominance.

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Subspecies of Three Eastern Phloxes

EDGAR T. WHERRY

In Rhodora for April, 1949, the late Professor M. L. Fernald published certain "emendations" of the names applied to Phloxes for inclusion in the forthcoming 8th edition of Gray's Manual. The field relations of these plants suggest the desirability of a different approach to their taxonomy and nomenclature.

The short-styled taxon *Phlox nivalis* Lodd.-Sweet entered the Appalachian region from the southwest. At some point reached during its northeastward range-expansion its styles became elongated and united nearly throughout, resulting in *P. subulata*. In 1929 the writer divided this into 3 taxa termed varieties, named *australis*, *brittonii*, and *ciliata*. Fernald proceeded to reduce the first of these to a forma of the second, which fails to express their actual relationship.

Infra-specific taxon *australis* is regarded as representing the ancestor of the group for the following reasons: its inflorescence-herbage is (barring rare mutants) consistently glandular, a primitive character in Phloxes in general; its corolla-hue is predominantly purple, corresponding to the presence of copious, acidic, anthocyan, also primitive; and it occupies the southwest portion of the species-range, eastern Tennessee to central Ohio and eastward, thus occurring nearest the species-progenitor.

In the course of its range-extension eastward and northward the taxon just discussed underwent evolutionary change in two directions. First, the hairs of the inflorescence-herbage gradually lost their gland-tips, so that in colonies in the middle Virginia-West Virginia boundary region about half the clones are glandless; and toward the north end of the range, from Michigan to New Jersey, glandularity appears only in rare cases, constituting less than 5% of the population. The type of the species, collected by Kalm in New Jersey, was glandless.

The epithet *ciliata* was applied to the glandless extreme in varietal status by Brand, and adopted by the present writer. According to the ruling of the International Botanical Congress of 1950, however, infra-specific taxa including the type are to be designated by repeating the species epithet. The glandless northeastern taxon must therefore bear the name *subulata*; in order to make clear that an infra-specific taxon is under discussion the writer will follow the

example of early taxonomists and precede this by the Greek letter *alpha* (α).

The other evolutionary advance exhibited by the northeastwardly migrating taxon *australis* consisted in diminution in the amount of anthocyan in the corolla, accompanied by reversal of the reaction of the cell sap from acid to alkaline, so that such color as remains, appearing chiefly on eye-striae and tube, is of violet hue. In this case no gradual change from one taxon to the other appears, and the geographic relations are different: the new taxon is limited to valley slopes of the Potomac River and the lower reaches of its tributaries. Since clones agreeing with the ancestral *australis* in habit and corolla morphology occur chiefly in the Piedmont portion of this range, the taxon under discussion is inferred to have originated there. In the course of migration up-stream, however, further evolution occurred: the plants and their parts tended to become reduced in size. There being little or no diminution in depth of notch in the petal-blades, the corolla-limb often took on a tenpoint-star pattern. These trends attained a maximum in plants which invaded the shale-barrens of the Virginia-West Virginia boundary region.

The species epithet *brittonii* was applied by Small to a clone exhibiting extreme development of these evolutionary trends, and Fernald considered his "description and comparative notes being remarkably clear and to the point." Neither of these authors was acquainted, however, with the field relations. After extended study of these, the writer in 1929 felt that it was undesirable to have a species comprise only a solitary clone, and accordingly expanded the definition of *brittonii* to cover the whole inter-grading Potomac valley series of plants. The differences between this and the other infra-specific taxa appearing then too slight to justify species independence, reduction to varietal status was carried out.

Since modern botanists are classing taxa exhibiting geographic relations like those just outlined as subspecies, it is now proposed to raise those under discussion here to that status. *Phlox subulata* L. comprises, then, the three subspecies:

- (1) *α -subulata*; (ssp. *eusubulata* var. *ciliata* Brand); the northeastern glandless purple-hued taxon, including the species-type.
- (2) *australis*, stat. nov.; (var. *australis* Wherry, 1929); var. *brittonii* f. *australis* Fern.); the southwestern glandular purple one.
- (3) *brittonii*, stat. nov.; (*P. brittonii* Small; var. *brittonii* Wherry); the Potomac valley glandular pale, violet-hued one.

In the *Rhodora* article above referred to, Fernald also took exception to the writer's treatment of *Phlox bifida* Beck. Before venturing to write upon this taxon, Gray's suggestion in connection with his proposal of *Phlox stellaria*, "the station should be rediscovered," was acted upon. The locality of Brand's var. *cedaria* near Lavergne was also hunted up. There being at the latter station no plants as short-leaved as Brand stated, his epithet was discarded, as based on an anomalous specimen.¹

Subsequent field study has brought out the following relationships: Upon expanding its range eastward, the short-styled taxon *Phlox oklahomensis* Wherry seemingly diverged into two well-differentiated species. In the Coastal Plain of Texas and eastward, reduction in leaf-size and diminution in notching in petal-blades gave rise to *P. nivalis* Lodd-Sweet. And in the Ozark Plateau of Arkansas lengthening and increasing union of styles yielded *P. bifida* Beck. The latter taxon, in most colonies, is like *P. subulata brittonii* in that the anthocyan of its corolla is sparse, and, as a result of alkalinity of cell sap, of violet hue. Moreover, because of the deep-blade-notch, to which the species epithet refers, the limb is of ten-point-star pattern, as in the shale-barren extreme of *brittonii*. This constitutes an interesting case of parallel evolution.

Expanding its range northward and eastward, *P. bifida* diverged into two infra-specific taxa: a widespread one, ranging from northern Arkansas to southern Wisconsin and Michigan, with the hairs on the inflorescence-herbage mostly gland-tipped and the petal-blades relatively deeply notched; and a more restricted one, in a narrow curved strip of territory from Arkansas to central Tennessee, eastern Indiana, and southern Michigan, with the hairs glandless or even lacking, and blades more shallowly notched.

Again the geographic segregation of the taxa favors their elevation in rank. *Phlox bifida* Beck comprises, then, the subspecies:

- (1) *a-bifida*; (var. *glandifera* Wherry, 1929); the widespread glandular-haired, deep-notched taxon, including the species-type.
- (2) *stellaria* (Gray) Wherry, **stat. nov.**; var. *cedaria* Brand, excluding description; var. *stellaria* (Gray) Wherry, redefined to comprise not only the original glabrous individual but also hairy though glandless clones among which it occurred.

¹Admittedly the Brand specimen was not a monstrosity such as that on which *Polemonium longii* Fernald op. cit. p. 6 was founded. The writer's field study of this showed it to be *P. reptans*, infected by a virus.

The Meadow Phlox, *P. maculata* L., is divisible into two geographic "varieties." When the writer sought epithets for these in 1933, he reduced to varietal status the earliest which had been applied to them as species, *odorata* Sweet for the northern and *pyramidalis* Smith for the southern one. Michaux had, to be sure, published two infra-specific epithets, α -*purpurea* and β -*candida*, and Fernald in the article to which the present one is a rejoinder urged that the first of these should be taken up in varietal status and the second in that of forma. Actually Michaux was not describing geographic varieties but only color-forms, and the writer considers it more scientific to follow "the spirit rather than the letter" in such cases. However, the two taxa under consideration here need epithets in subspecies status and these are hereby published as:

(1) α -*maculata*; *P. odorata* Sweet; var. *odorata* Wherry; the northern, early-blooming, sparse-leaved taxon.

(2) *pyramidalis* (Smith) Wherry, **stat. nov.**; *P. pyramidalis* Smith; var. *pyramidalis* Wherry; α -*purpurea* Michaux, redefined by Fernald as a geographic variety instead of color-form; the southern late-blooming many-leaved one.

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Rubus Concentrations Along the West Virginia-Maryland Border

H. A. DAVIS and TYREECA DAVIS

In recent years Bailey, Fernald, and others have described hundreds of new species of *Rubus*. Only time and careful study of growing plants and complete herbarium specimens will tell how many of these proposed species will be ultimately accepted by conservative taxonomists. The present writers are convinced that many of them are good. As Dr. Bailey points out in his publications, these species were not previously described because the herbaria of the country do not, or at least did not, contain complete specimens. A *Rubus* specimen, in order to be satisfactory for critical study, must consist of a generous section of a typical florican and a generous section of a primocane from the same plant.

When studying the recent papers dealing with the genus, one is at first astonished by the great number of species described from certain small areas. It would appear that, if the entire country were collected as carefully as these small sections, the species resulting would be numberless. But this does not seem to be the case. It appears that unusual forms of *Rubi* are concentrated in certain areas, and that one can search for miles in other areas and find only a few comparatively well known species.

One of the most unusual concentrations of *Rubus* species in the United States occurs in a small area along the state line between Preston County, West Virginia, and Garrett County, Maryland. This region, which includes Terra Alta and Cranesville, West Virginia, and Oakland and Mountain Lake Park, Maryland, can be enclosed in a circle with a radius of seven miles. This area lies mostly between 1250 and 2800 ft. altitude, and contains a varied terrain of forested and cut over areas, farm land, glades, swamps, and artificial lakes. Fifteen miles due north of Cranesville another concentration of similar species occurs in the glady area along Feik Run, just across the state line in Fayette County, Pennsylvania, west of Markleysburg. This latter area was not investigated for *Rubus* until late in the summer of 1950, when a few items were collected there by the writers. These are included in the following list.

For economy of space, we shall refer to localities by numbers, as indicated below.

Preston County, West Virginia:

1. Shores and lowlands around Lake Terra Alta.
2. Flats of Snowy Creek near Hopemont.

3. Higher land around Terra Alta.
 4. Vicinity of Cranesville.
 5. Brandonville-Glade Farms area.
 6. Decker's Creek flats near Reedsville.
- Garrett County, Maryland:
7. Waste land near the lake in the village of Mountain Lake Park.
 8. Oakland region.
- Fayette County, Pennsylvania:
9. Roadside near Markleysburg.
 10. Feik Run glades west of Markleysburg.

Numbers 1, 2, 3, 4, 7, and 8 are within the seven mile radius mentioned above. The other neighboring areas are included for completeness. Unless otherwise indicated, the known distribution of the species is confined to the region. When the type specimen was collected in the area considered, the word "type", followed by the collectors name, appears in parenthesis following the appropriate number.

1. *Rubus pubescens* L. 4. A wide ranging northern plant.
2. *R. hispidus* L. Common in the Alleghenies, and far northward.
3. *R. Davisiorum* Bailey. 2, 3 (type, Davis), 8.
4. *R. vagulus* Bailey. 1 (type, Davis), 7, 10.
5. *R. zaplutus* Bailey. 1 (type, Davis), 4, 7.
Found also near Mt. Storm, Grant Co., W. Va.
6. *R. notatus* Bailey. 1 (type, Bailey), 2, 7, and in Laurel Run Swamp, Negro Mt., Somerset Co., Pa. Varieties from Michigan and Connecticut.
7. *R. Ribes* Bailey. 7 (type, Bailey), 8.
8. *R. nocivus* Bailey. 1, 2 (type, Steele), 7, 10.
9. *R. angustifolius* Bailey. 2 (type, Steele).
10. *R. racemiger* Bailey. 2 (type, Steele), 7.
11. *R. discretus* Bailey. 1, 7, and the type station in Canaan Valley, Tucker Co., W. Va.
12. *R. flagellaris* Willd. 6. A widespread species doubtless occurring elsewhere in our area.
13. *R. roribaccus* Rydb. 5. Common in eastern W. Va. and in neighboring states.
14. *R. cordialis* Bailey. 3. A common and variable species of the central Allegheny region.

15. *R. dives* Bailey. 3 (type, Steele), and near Kingwood, Preston County, W.Va.
16. *R. injunctus* Bailey. Along Cheat River, between Kingwood and Terra Alta, Preston Co., W.Va. Rather common in northern W.Va.
17. *R. pronus* Bailey. 1, 6, 7 (type, Bailey). Also collected in Webster and Nicholas Cos., W.Va.
18. *R. varus* Bailey. 1, 6, 7 (type, Bailey), 9, 10. Also collected in Hampshire, Nicholas and Webster Cos., W.Va.
19. *R. clandestinus* Bailey. 1 (type, Bailey). The only other known station is in the Canaan Valley, Tucker Co., W.Va.
20. *R. plicatifolius* Blanchard. 7. Widespread northeastern species.
21. *R. cordifrons* Bailey. 4, 5, 8, 9. Frequent in parts of W.Va., Md., and Va.
22. *R. inobvius* Bailey. 3 (type, Steele?), 4, 6, 8.
23. *R. terraltanus* Bailey. 3 (type, Steele).
24. *R. Macdanielsii* Bailey. 5, 6, 8, 9. Collected in several other Md. and W.Va. counties.
25. *R. Sharpii* Bailey. 4 (type, Sharp), 10.
26. *R. vegrandis* Bailey. 4 (type, Davis).
A poorly understood plant known only from the type colony, which was destroyed by road improvement.
27. *R. monongaliensis* Bailey. Along Cheat River near Albright, Preston Co., W.Va. Abundant productive blackberry of northern W.Va.
28. *R. canadensis* L. 5. A common species in the higher Alleghenies and far northward.
29. *R. allegheniensis* Porter. Common in wooded areas throughout the northeastern United States.
30. *R. Rosa* Bailey. 5, 6. Widespread eastern species.
31. *R. uber* Bailey. 1, 2, 3, 4. Common woodland species of the Allegheny Mountain region.
32. *R. marilandicus* Bailey. 3. An ill-defined species found in the mountains of W.Va. and Md.
33. *R. reravus* Bailey. 2, 3, 6, 7 (type, Steele), 10.
34. *R. abactus* Bailey. 3, 4. Common in eastern and central states.
35. *R. philadelphicus* Blanchard. 3, 4. Frequent in the eastern states.

36. *R. difformis* Bailey. 2, 3 (type, Steele), 7. Also collected east of Deer Park in Garrett Co., Md.
37. *R. pensilvanicus* Poir. 4, 6. Common in eastern states.
38. *R. pulchrisflorus* Bailey. 5, and doubtless throughout the area. Frequent in W.Va. and adjacent states.
39. *R. occidentalis* L. Common in the area, and throughout eastern half of U. S. and Canada.
40. *R. odoratus* L. Observed, but not collected in our area. Common in the eastern states.

In addition to the above, undescribed species collected in the area and still under study are as follows:

- (a) A member of the *Hispidi* related to *R. zaplutus*. 1, 10.
- (b) A *Setosi* similar to *R. nocivus*. 7, 10.
- (c) A relative of *R. Sharpii*. 4, 8, and in several other W.Va. mountain counties.
- (d) A member of the *Alleghenienses*. 1, 7.
- (e) *R. argutus* Link, or a near relative. 3, 6.
- (f) A major species of the *Arguti* Lati. 3, 5, 6, and throughout the mountain counties of northern W.Va.
- (g) Another well defined *Arguti*. 4, 6, near Albright, Preston Co., W.Va., and in Hampshire Co., W.Va.
- (h) An *Arguti*. 2, 4, 6, and related forms in Nicholas and Webster Cos., W.Va.

Many other such areas of *Rubus* concentrations occur, such as Kalamazoo Co., Michigan, from which C. R. Hanes lists forty species and varieties, and the Kinnickinnic area in St. Croix Co., Wisconsin. In contrast we might mention the Cheat Bridge-Durbin area in Randolph and Pocahontas Cos., W.Va.—a region of forests, glades, and swamps similar to the region under consideration, and with a similar non-*Rubus* flora, where considerable collecting has been done by many collectors including ourselves. From this area we can report *R. pubescens*, *R. hispidus*, *R. Huttonii*, *R. canadensis*, and no others.

We have no explanation for this spotty distribution of *Rubus* species. The areas of concentration may be regions where, for some unknown reason, comparatively rapid evolution is taking place, or they may be regions where various ancient species have survived.

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Red and the Red-kin Colors in Bird-visited Flowers

A. L. PICKENS

The splendid color, the graceful form, the lovely perfume of the most magnificent flower arose, after all, as expression of an admirable utilitarian animal instinct. Some of our one-track modern conservation might well learn a lesson here. We are becoming monomaniacs on pine-plantings, but notice how in naturally restored eroded areas tuliptrees border and bind the worst gullies, or grow right within them as rapidly as do pines, yet adding a majesty and beauty of which pines are incapable. A nature lover recently reported a slaughter of hickories near a pine project, to get rid of squirrels in order to get rid of irresponsible hunters. If those hickory stumps sprout it may be fifty years before they bear nuts again, for hickories grow and reproduce very slowly, and white hickory is one of the most useful and fragrant of trees. Most of our landscapes could stand more consideration of arboreal beauty. Now, promiscuous poisoning by the narrowly trained begins to show us the value of many of the insects to which we had given no thought as pollinators. America needs a high-priest of the rites of pollination such as Knuth has been in Europe. How little we know of the subject! Does anyone know whether or not humming-birds visit dandelions, daisies, or magnolias? It is easy to blanket-imply as did Audubon and Wilson that they are inclined to visit *all* or *half* of the flowers. In the 1920's Dr. Otto Porsch of the Hochschule für Bodenkultur in Vienna asked for a list of our flowers that hummingbirds had been seen to visit. Previously interested in pronounced ornithophilic flowers, and neglecting the semi-ornithophilic and the merely bird-visited, I nevertheless found the question intriguing. A short list was forwarded to him which he to a large degree incorporated in his "Vogelblumenstudien" published in Leipzig in 1929. With additional encouragement from the late Dr. Joseph Grinnell of the University of California additional semi-decadal lists have been issued, with the aid of a loosely integrated group of kindred-minded hobbyists from New England to the West coast, and from Lake States to Gulf States. The last appeared as a laboratory sheet in 1946. Almost from the start the lists showed scientific potentialities. Neltje Blanchan, who did so much to popularize pollination problems, and who for too long remained undiscovered by the professionals, considered red as the favorite color of the hummingbird. As she so strikingly put it, the bird, like Eugene Fields, held as a favorite color any color at all so long as

it was red! Private research proved Spanish Princess (*Macranthera Lecontei*) to be almost an ideal humming-bird flower mechanically. Yet it was orange in color; at times perhaps, even merely yellow. These lists afforded statistical material to test this point. From the very start red species assumed the lead. Violet dropped into second place and orange a third. The other colors and white trailed. Through the years, red, if we count in its shades and tints, continues to hold the lead. Orange dropped out quickly; the last three semi-decadal lists contain only one good example. Orange flowers, of course are somewhat rare if we exclude golden-yellows. Violet seems more favored than was anticipated.

What part does the naturalist's tendency to be drawn by red play? How does size and shape of the flower affect the bird's choice? Uniform in size and shape, artificial flowers holding sweetened water were placed in the open. Violet took the lead, but red and orange were still above the other colors. As exposure faded the violet to blue and the orange to yellow both dropped in favor. Still other flowers uniform in size and shape were placed out, perhaps fifteen miles away. Violet led again. Red and white tied for second place, but the red container had been drained at the first visit and so was handicapped. In the previous experiment something of this nature occurred too. One bird was detected stretched on a large leaf before the red flower, like a basking squirrel, as if trying to drain all the nectar from the container at one visit.

The fifth semi-decadal list for the Nearctic area is here offered. Where "etc." follows the scientific name more specific identification is desired; the species named has similar relatives of the same genus almost as probable, and several, instead of one record would seem likely. And surely all species of red columbine are visited despite our lack of records. There must be several specialized *bona fide* ornithophilic flowers, especially in our Southwest, awaiting better records. Responses from that area have been better than ever before. Thanks are due Mrs. Bruce Reid, B. C. Tharp, Howard S. Dittmer, Lois Ames, Chester F. Deaver, Walter S. Phillips, and Frank E. Todd. Correspondence with, and a commendable article in *Castanea* (1948) by R. L. James have aided greatly. Aretas Summers continues to assist with his observations.

Sprunt and Chamberlain in "South Carolina Birds" tell of Mrs. F. Barrington seeing the Orchard Oriole feeding from Coral Honeysuckle. This brings to 21 species, the birds other than hummingbirds that have been seen to visit flowers in the Nearctic area.

POLYGONACEAE	Rosa-de-montana	<i>Antigonon leptopus</i>	Pink
RANUNCULACEAE	Wild Larkspur Tall Larkspur	<i>Delphinium geraniifolium</i> , etc. (Ariz.) <i>Delphinium glaucum</i> (Calif.)	Violet Violet
NELUMBONACEAE	Blue Lotus	<i>Nymphaea elegans</i>	Blue; white
BERBERIDACEAE	Agarita	<i>Berberis trifoliola</i>	Yellow
FABACEAE	Texas Acacias Mimosa Rattlebox Alfalfa	<i>Acacia folicina</i> , etc. <i>Mimosa strigillosa</i> , etc. <i>Crotalaria spectabilis</i> <i>Crotalaria striata</i> <i>Medicago sativa</i>	Yellow Pink, etc. Yellow Yellow Violet
KOEBERLINIACEAE	Allthorn, or Junco	<i>Koeberlinia spinosa</i>	Whitish, or greenish
TILIACEAE	Basswood	<i>Tilia americana</i>	Yellowish
MALVACEAE	Poppy Mallow Texas Wild Mallows Giant Mallow	<i>Callirhoe papaver</i> , etc. <i>Malvastrum</i> spp. (?) etc. <i>Hibiscus grandiflorus</i>	Red-purple, etc. Red, etc. Pink and red
THEACEAE	Camellia	<i>Camellia japonica</i>	Red, pink, etc.
CACTACEAE	Opuntias	<i>Opuntia humifusa</i> , etc.	Yellow, red, etc.
ERICACEAE	Calico-bush	<i>Kalmia latifolia</i>	Pink
APOCYNACEAE	Periwinkle	<i>Vinca minor</i>	Blue
CONVOLVULACEAE	Wild Morning-glory	<i>Ipomoea littoralis</i> , etc.	White, etc.
POLEMONIACEAE	Wild Blue Phlox	<i>Phlox divaricata</i>	Blue

SOLANACEAE	Jamestown Weed	<i>Datura tatula</i>	Violet
VERBENACEAE	Bee Brush	<i>Aloysia ligustrina</i>	White and violaceous
MENTHACEAE	Lyre-leaf Sage Bee Balm Citronelle	<i>Salvia lyrata</i> <i>Monarda mollis</i> <i>Collinsonia canadensis</i> , etc.	Blue Lilac Yellow
SCROPHULARIACEAE	Humming-bird Weed Southern Beard-tongue Foxglove Yellow Monkey-flower Gerardia	<i>Scrophularia parviflora</i> <i>Penstemon australis</i> <i>Penstemon digitalis</i> <i>Mimulus aurantiacus</i> <i>Gerardia filifolia</i>	Violaceous Violaceous Pinkish, etc. Yellow Pink
RUBIACEAE	Ishwara Flower	<i>Ixora chinensis</i> <i>Ixora coccinea</i>	Red Red
CAMPANULACEAE	Wide Bell-flower	<i>Platycodon grandiflorum</i>	Blue; white
CARDUACEAE	Arizona Thistle	<i>Cirsium arizonicum</i>	Violet
LILIACEAE	Spanish Bayonet Gasterias	<i>Yucca aloisifolia</i> , etc. <i>Gasteria</i> spp.	White Red and green
AMARYLLIDACEAE	Lechuguilla Prairie Lily Jacobean Lily Valley Lily	<i>Agave lechuguilla</i> , etc. <i>Cooperia drummondii</i> , etc. <i>Sprekelia formosissima</i> <i>Atamosco texana</i> , etc.	Greenish White Red Yellow
IRIDACEAE	Shreve Iris	<i>Iris shrevei</i>	Violet

General Summary: Five semi decadal lists, including the above, record less than five hundred flowers known to be visited by birds of the Nearctic region. Most of the visitors were humming-birds, but 21 species of other avian visitors were recorded.

Red appears to be the favorite color for a bird-flower, but with artificial flowers of uniform shape and size violet seems to lead. This may be due to the bird's tendency to linger longer at the red and drain the contents earlier, for red is the usual color of flowers specialized for humming-bird pollination. Of the red-kin colors, orange is shown by several flowers specialized among the bluish shadows of humid eastern swamps and forests, and violet apparently by a few such in the arid chaparral and steppes of the more golden-lighted west. Thus contrast seems to play a part in color selection at times. Red has been the leading color from the beginning but has dropped from 33% to 27%, or with pink included, from 42% to 40%. This is noteworthy when the comparative rarity of red flowers is remembered. Some Holarctic genera, violet and blue in the Old World, show red species only in the New World and to a more marked degree in the Far West where more species of humming-birds are found.

QUEENS COLLEGE,
CHARLOTTE, N.C.

***Narcissus poetaz* Hort. naturalized in Virginia**

H. A. ALLARD

During a trip to Lignum in Culpeper County, Virginia, in May 1948 I was surprised to see near there an old field of several acres literally covered with the flowers of *Narcissus poetaz*, a horticultural hybrid creation. This field was fairly whitened with flowers, and it was at once evident that this species was abundantly naturalized here.

On June 17, 1950, I again visited this field but flowering had passed. A portion of the field had been mowed, but I secured more than a bushel of fine bulbs with very little digging.

The origin and history of this enormous natural planting of *Narcissus* being desired, I visited the home of some colored people living across the road near by for information. I was told that years ago a cabin stood in this field and bulbs of this species had been planted and grew around the dwelling. This was later removed or

burned and the field for years was plowed and planted to corn and other crops. The bulbs of the original small planting were ultimately scattered about by ploughing and cultivation until the entire field has become a flower garden covered with the plants. As a result of fallowing which left the plants undisturbed, enormous clumps developed over the entire area as they appear at the present time.

This horticultural form originated in Holland about 1885 as a hybrid race from the cross *Narcissus tazetta* and *N. poeticus* var. *ornatus*, the last named being the seed parent. It has characteristics of both parents since it is a polyanthus narcissus, bearing 2-6 flowers on a stem as does the *N. tazetta* parent, but with the larger more showy flowers of the mother parent. They are fragrant, but less so than the *N. tazetta* flowers.

No evidence has been seen of seed pods in this field, so that the plants must have been disseminated here by breaking up of the clumps and scattering of the enormous number of tubers. Ploughing however, is a particularly thorough method of breaking up the huge bulb colonies of this hardy form and scattering the bulbs about. If seed were produced, the attainment of the flowering stage would be much slower than in the case of bulb offsets for these arrive much more quickly to the flowering stage than seed. It would require a very determined effort to completely exterminate these plants now by mere cultivation, and this would require years of persistent destruction throughout the vegetative season. I can vouch for this since in my own garden a large patch of narcissus bulbs was allowed to become established and overcrowded. For several years I have made strenuous efforts to dig up every individual bulb, but the work after several years is not entirely finished.

ARLINGTON, VA.

An Early Record of *Tussilago farfara* in Maryland

CLYDE F. REED

Recently S. F. Blake (*Rhodora* 53: 93. 1951) reported *Tussilago farfara* L. in Maryland for the first time. His specimens were collected from 1938 to 1950 in the region of Calvert Cliffs (Calvert County), more recently known as Kenwood Beach, on the Chesapeake Bay.

While reading this article, I felt that I had specimens of this species from Maryland in my herbarium, and upon investigation found a sheet with two healthy plants and eight flowering or fruiting stalks. These specimens were collected May 5, 1903 at Back Shore in Baltimore County and had been deposited in the collections of Charles C. Plitt under the number "574". (The numbers in the Plitt Collection refer to species, not specimens). The majority (about 90%) of the Plitt Collection, once housed by the Maryland Academy of Sciences, is now included in the Reed Herbarium (now containing about 15,000 specimens of Maryland plants). There is no definite statement of the collector's name on the sheet (nor on any of the sheets of the Plitt Collection).

The specimens of *Tussilago farfara* at hand must have lived in a black loamy soil, since the upper parts of the tap roots and the smaller secondary rootlets have particles of a black soil adhering to them. The locality in Baltimore County is about half way between the locality in Calvert County, about fifty miles to the south, and the localities in Pennsylvania, referred to in Gray's Manual, Eighth Edition, as the southern limit for the species in this region. Thus the collections mentioned by Blake and in this article extend the distribution about one hundred miles southward in Eastern North America. A more thorough search for this plant along the coast of the Chesapeake Bay will probably afford more specimens of this species.

REED HERBARIUM,
BALTIMORE, MARYLAND

NOTES and NEWS

WHITE-FLOWED FORM OF BLUEBELLS (*MERTENSIA VIRGINICA*)—*Mertensia virginica* (L.) Pers. **forma alba, f. nov.**, a forma typica corolla alba differt.—Virginia. A single plant with pure white flowers was found April 23, 1950, among thousands with blue flowers in a flood plain wooded swamp on the Triassic area along Broad Run, east of Pond Mountain highlands, 1½-2 miles south of Thorofare Gap, Bull Run Mountain, Va. *Allard 19589*, U. S. National Herbarium, Type number 2,005,195.

The freshly opened flowers of typical *Mertensia virginica* are light blue in color although these are usually a decided pink in bud. There is some variation in the shade of blue, and some plants are characterized by pinkish or pale bluish white flowers. The form with pure white flowers is very rare, and I have met with only one or two plants among many thousands with blossoms of the typical blue color.—H. A. ALLARD; WASHINGTON, D. C.

ON THE PROPOSED CHECK LIST OF SOUTHEASTERN PLANTS—In the June 1951 *CASTANEA*, Miss Lillian Arnold published a note concerning the "Proposed Check List of Southeastern Plants." In my opinion this is one of the most important projects which the botanists of the southeastern states could undertake. However, in bringing such a check list together, several items should be considered.

The nomenclature in Small's *Manual* (except for a few minor slips, inevitable in a work of such magnitude) is in accord with the International Rules of Botanical Nomenclature of the date of publication. Therefore such a work will involve a reconsideration of Small's *taxonomic concepts*. It is generally agreed that Small was a "splitter"; on the other hand, reaction to this on the part of a revisionist, accompanied by indiscriminate "lumping," is not necessarily a satisfactory answer to the problem. Small recognized no varieties; therefore anything "different" automatically became a species with him. Contrarily, Fernald was a great believer in "variety and form" and has, in the opinion of some, erred quite as far in the other direction. One must be quite frank and say that it is not always easy to decide whether Fernald's systematic decisions are more sound than Small's. In making up the proposed check list

each author will have to weigh the taxonomic problems very carefully; it is not merely a matter of name changes, as some have imagined.

Naturally, in a work involving such a large series of plants, it will not always be possible to find people fully acquainted with the various groups; therefore certain arbitrary decisions will have to be made and we can only hope that they are as good as possible at the present time.

Miss Arnold mentioned that the publication of the lists might take one of two courses: that of publication of segments as received over a period of years, or the publication of the check list as a single unit. At first glance this latter course might seem to be advisable; on the other hand, I have a strong suspicion that it would almost pre-doom the project to failure. In the first place, the problem of getting enough people to tackle this project in a reasonably short time is almost insurmountable; therefore the manuscripts already in hand might have to be held for 10 or even 15 years, at which time they would be almost out-of-date. Secondly, no author likes to see his work buried in *Mss.* form for that long a period of time. As a result, many would be most reticent about attempting the type of work required, particularly in large groups which involve considerable expenditures of time and energy.

CASTANEA would seem to be the logical place to publish these check lists—and they should be published as they become available, even if out of taxonomic order. In this way, authors will see that the project is a going affair, that their work can be published within a reasonable period of time and, therefore, will be much more ready to tackle the job. Furthermore, as soon as such a list is published, it can be examined by other botanists and any errors or omissions noted. If one were to wait for a long period and publish a complete check list, there would be no way to ascertain the inevitable errors until after the project were completed.

I would, therefore, strongly suggest that the committee consider this publication in *CASTANEA* as a preliminary list. It can be a basic check file and all errors, either of omission or commission noted. Such a check list, appearing in relatively small parts, also would greatly stimulate interest in the individual groups as they appeared; this would certainly lead to added information. Then when the series is finally finished, the whole thing could be re-edited, and published as a small volume.

The question comes up about format. I do not know what format is used in the manuscripts already at hand. However, before

any of them are published I feel the committee ought seriously to consider having a standard format and that each author be held to it. Naturally, such a Check List, if it is to be really useful, must contain references to the names used by Small. Miss Arnold suggests that it might be largely in conformity with the names in *Gray's Manual* (current edition). Information at hand indicates that Gleason's revision of the *Britton and Brown Illustrated Flora* is coming along, with parts already in page proof. With any sort of luck this should be out within the next year. Therefore since the Southeastern Check List has waited this long, one might wonder whether it would not be an excellent idea to wait just a little longer, in the meantime working out a satisfactory and functional format which would contain the name of the plant and any variant name or disposition recognized in Small, the new Gray's, and the new Britton and Brown.

The mechanics of publication presents certain problems. It could be done in the regular pages of *CASTANEA*. However, there might be considerable advantage in having the Check List appear as a special supplement with a separate pagination. It could be printed separately and stapled into the issue, or it might even be loose. It could, in fact, be punched to fit some standard note book. As a further refinement, families and orders might perhaps be printed as units, to be arranged in taxonomic sequence by the members as they appeared. To facilitate this, the first issue of the Check List should have in it a list of families, each with a number. As the families were published, they would have corresponding numbers and so could be properly placed in the notebook with considerable ease. Thus, each member of the Club could build up his own desk reference copy as the parts appeared.

This would take a bit of planning on the part of the Committee. A preliminary analysis, even of Small's *Manual*, would give a very accurate estimate of the number of taxa involved—orders, families, genera, and especially species. From such a list, a surprisingly accurate schedule of the "parts" could be made up ahead of publication, *when once a standard format had been established*. With this at hand the Committee then could concentrate on "cleaning up" certain parts, so that an issue could be gotten out with as little waste space (blank paper) as possible. For example, it might be calculated that the Orchidales would take up slightly less than a single "part." Having found a specialist willing to do the order, the Committee then might plan to get one or more people tackle the relatively few families, genera and species of Scitaminales (Order 11), and have them on

hand to make a "part" economic for publication as a unit along with the Orchidales (Order 12).

One also would think that it would be more valuable if the check list also could contain a summary of distributions. Occasionally Small indicates the presence of a plant in some area for which there is no known authenticating specimen. I once asked Small about some of these and he grinned and admitted that, in certain instances, the plants had not yet been collected but that, sooner or later they would be—that he had put those in just to make botanists "dig" a little harder. In many instances Small was right and the plants subsequently were found in the areas where he indicated they would be; but one feels that such erroneous "distributions" should be noted. This, of course, would take the present project somewhat out of the category of a strict check list and add to the burden of the author of each section. On the other hand, it would add immeasurably to the usefulness of the work if at least generalized distributions could be included (with the "from-to" sequences standardized for all groups!), provided it did not add too greatly to the bulk of the work so as to make publication impractical.

Such a project, if taken on by the Club, possibly would curtail the regular pages of *CASTANEA*, printing costs being what they are today; it is a small sacrifice which all of us should be willing to make for the general good. On the other hand, if actively pursued, such a series would almost be certain to stimulate an increase in membership. It would be of such value that institutions, even interested individuals, might be willing to subsidize the publication of one or more of the "parts," and so hasten it to completion.—W. H. CAMP, ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

OAK WILT FOUND IN WEST VIRGINIA—The oak wilt disease, caused by the fungus *Chalara quercina*, has this summer been found rather widely scattered in West Virginia. It has been located in the vicinity of Morgantown and Cheat Lake in Monongalia County, on the Coopers Rock State Forest in Preston County, near Purgitsville in Hardy County, and close to the towns of Riverton and Cave in Pendleton County. A tree has been found in Pocahontas County near Arborevale and in Wood County near Mineral Wells. In Cabell County there are cases of the disease in Barboursville near Huntington. Trees also have been found near Dunbar, Hamlin, Madison, and Sharples in Kanawha, Lincoln, Boone and Logan Counties respectively. Last year the disease had been found in Ohio and Pennsyl-

vania. It has long been recognized as widespread in the middle west.

The West Virginia trees have been located in a state-wide informal survey in which West Virginia University, the West Virginia Conservation Commission, and the West Virginia State Department of Agriculture cooperated. Important assistance in this program has been given by personnel of the U. S. Forest Service on the Monongahela National Forest, the U. S. Department of Agriculture Blister Rust Control Agency of the Bureau of Entomology and Plant Quarantine, and by private foresters, county agricultural agents, and owners of affected trees.

The discovery of oak wilt so widespread within the state is considered a potentially dangerous threat to the oak forests that make up more than half of the timber resources of West Virginia. At present, however, there seems to be no need of selling oak timber at small diameters or salvage prices within the state. It is hoped that control methods now known, together with others yet to be worked out, will effectively check the disease before it becomes as severe in the Appalachian region as it has in Wisconsin and Iowa.

The disease is a vascular wilt and is known to be spread to adjacent trees-through root grafts. It also spreads over greater distances but the agency accounting for its wider distribution is not yet known. Wind does not spread the disease as it did Chestnut Blight, so that oak wilt is not expected to develop with the rapidity which characterized that disease.—R. P. TRUE, ASSOCIATE PLANT PATHOLOGIST, WEST VIRGINIA UNIVERSITY.

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